

Amdt. dated February 6, 2006
Reply to Office action of October 5, 2005

Serial No. 09/972,310
Docket No. SJO920010108US1
Firm No. 0037.0129

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently Amended) ~~A system for managing a storage area network (SAN) of the type that a plurality of components, including [[any of]] storage devices and digital data processors, the improvement comprising:~~

~~a first [[element]] component that maintains a first representation of [[the SAN]] a topology of the storage devices and digital data processors in the network and that generates an event notification indicative of [[an event]] a change to the topology with respect to the [[SAN]] network[[,]];~~

~~a second [[element]] component in communication with the first [[element]] component, the second [[element]] component maintaining a second representation of the topology [[SAN]] and responding to the event notification by~~

~~accessing the first representation; [[and]]~~

~~updating the second representation;~~

~~the second element responding to determining a discrepancy between the event notification and an attribute of any of the first and second representations [[by]]; selectively disregarding the event notification or recovering the second representation from one or more attributes of the first representation in response to determining the discrepancy.~~

2. (Currently Amended) ~~[[In the]] The system of claim 1, the improvement wherein the SAN comprises network further includes a plurality of hosts, each coupled via a first network with one or more storage [[units]] devices over the network; the hosts and storage units collectively comprising the components;~~

~~one or more agents each associated with one or more of the hosts, each agent generating a scan identifying attributes of any of (i) the host with which it is associated, (ii) [[a]] one or more of the storage [[unit]] units to which that host is coupled, and (iii) a relationship therebetween[,.]; and wherein the agents are in communication coupling with the first~~

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[[element]] component, wherein the agents a-transmitting transmit the scan [[thereto]] to the first component.

3. (Currently Amended) [[In the]] The system of claim 2, the improvement wherein the agents transmit the scans to the first [[element]] component asynchronously with respect to one another.

4. (Currently Amended) [[In the]] The system of claim 1, the improvement wherein the first representation comprises scans received from the one or more agents.

5. (Currently Amended) [[In the SAN]] The system of claim [[3]] 2, the improvement wherein the hosts comprise digital data processors and the agents execute on the host digital data processors.

6. (Currently Amended) In the SAN The system of claim [[4]] 5, the improvement wherein the network comprises a first network, further comprising a manager digital data processor that is coupled to the host digital data processors by via a second network, wherein the first and second [[element]] components execute in connection with the manager digital data processor.

7. (Currently Amended) [[In the SAN]] The system of claim 1, [[the]] further [[improvement]] comprising functionality that recovers the second representation by performing at least one of the following operations: [[any of]]

- i) clearing the second representation and rebuilding that representation from attributes of the first representation[[,]];
 - ii) comparing the first and second representations in whole or in part, and copying from the first representation to the second representation attributes missing from the latter, while any of deleting or marking as missing attributes in the second representation indicative of components present in the second representation but not in the first representation[[,]]; and
 - iii) copying from the first representation to the second representation one or more attributes indicative of any of (a) a component or relationships represented by an attribute in

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connection with which the discrepancy occurred, and (b) a component or relationship in a region a component or relationships represented by an attribute in connection with which the discrepancy occurred.

8. (Currently Amended) [[In a]] A system for managing a storage area network (SAN) of the type that a plurality of components, including any of storage devices and digital data processors, the improvement comprising:

a first [[element]] component that maintains a first representation of a topology of the storage devices and digital data processors in the network [[the SAN]] and that generates an event notification indicative of [[an event]] a change to the topology with respect to the [[SAN,]] network;

a second [[element]] component in communication with the first [[element]] component, the second [[element]] component maintaining a second representation of the [[SAN]] network and responding to the event notification by:

accessing the first representation [[and]]; updating the second representation;

the second element disregarding the event notification in response to determining at least one of: [[if any of]]

i) the event notification is indicative of addition of a new component to the [[SAN]] network and an attribute of the first representation is indicative of absence of that component[[,]];

ii) the event notification is indicative of addition of a relationship between components of the [[SAN]] topology and an attribute of the first representation is indicative of absence of that relationship[[,]];

iii) the event notification is indicative of addition of a relationship between components of the [[SAN]] topology and an attribute of the second representation is indicative of the absence from the [[SAN]] topology of one of the components to that relationship[[,]];

iv) the event notification is indicative of a missing component of the [[SAN]] topology and an attribute of the second representation indicative of the absence of that component from the [[SAN,]];

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v) the event notification is indicative of a missing component of the [[SAN]] topology and an attribute of the second representation indicates representation of that component in the second representation, but the absence of that component from the [[SAN,]];

vi) the event notification is indicative of a missing relationship between components of the [[SAN]] topology and an attribute of the second representation indicative of absence of that relationship in the second representation[[.]]; or

vii) the event notification is indicative of a missing relationship in the [[SAN]] topology and an attribute of the second representation indicates inclusion of that relationship in the second representation, but the absence of that component from the [[SAN]] topology.

9. (Currently Amended) [[In a]] A system for managing a [[storage area]] network (SAN) of the type that a plurality of components, including any of storage devices and digital data processors, the improvement comprising:

a first [[element]] component that maintains a first representation of [[the SAN]] a topology of the storage devices and digital data processors in the network and that generates an event notification indicative of [[an event]] a change to the topology with respect to the [[SAN,]] network;

a second [[element]] component in communication with the first [[element]] component, the second element maintaining a second representation of the [[SAN]] topology and responding to the event notification by

accessing the first representation [[and]]; and

updating the second representation;

the second element responding to determining a discrepancy between the event notification and an attribute of any of the first and second representations [[by]]; and

selectively recovering the second representation from one or more attributes of the first representation [[if any of]] in response to determining at least one of:

i) the event notification is indicative of addition of a new component to the [[SAN]] topology and an attribute of the first representation is indicative of the presence of that component[[.]]; and

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- ii) the event notification is indicative of addition of a relationship between components of the [[SAN]] topology and an attribute of the second representation is indicative of the presence of that relationship[[,]];
- iii) the event notification is indicative of modification of an attribute of a component of the [[SAN]] topology and an attribute of the second representation is indicative of the absence from the [[SAN]] topology of that component[,,]; or
- iv) the event notification is indicative of modification of an attribute of a component of the [[SAN]] topology and an attribute of the second representation indicative of inclusion of that component in the second representation but its absence from the [[SAN]] topology.

10. (Currently Amended) [[In a]] A method of managing a ~~storage area network~~ (SAN) of the type that a plurality of components, including any of storage devices and digital data processors, the improvement comprising:

maintaining a first representation of [[the SAN]] a topology of the storage devices and digital data processors in the network and generating event notification indicative of a change to the topology [[an event]] with respect to the [[SAN,]]network;

maintaining a second representation of the [[SAN]] topology and responding to the event notification by:

accessing the first representation[, and]];
~~updating the second representation,~~
~~responding to determining~~ a discrepancy between the event notification and an attribute of any of the first and second representations [[by]]; ~~and~~
selectively disregarding the event notification or recovering the second representation from one or more attributes of the first representation in response to determining the discrepancy.

11. (Currently Amended) [[In the]] The method of claim 10, ~~the further improvement~~ wherein the recovering [[step]] operations includes [any of]] at least one of the operations comprising:

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i) clearing the second representation and rebuilding that representation from attributes of the first representation[[,]];

ii) comparing the first and second representations in whole or in part, and copying from the first representation to the second representation attributes missing from the latter, while any of deleting or marking as missing attributes in the second representation indicative of components present in the second representation but not in the first representation[[,]]; and

iii) copying from the first representation to the second representation one or more attributes indicative of any of (a) a component or relationships represented by an attribute in connection with which the discrepancy occurred, and (b) a component or relationship in a region a component or relationships represented by an attribute in connection with which the discrepancy occurred.

12. (Currently Amended) [[In the]] The method of claim 10, the further improvement wherein the responding step includes responding to determining the discrepancy that results in selectively disregarding the event notification comprises determining an event notification indicative of addition of a new component to the [[SAN,]] topology and an attribute of the first representation indicative of absence of [[that]] the new component, by disregarding the event notification.

13. (Currently Amended) [[In the]] The method of claim 10, the further improvement wherein the responding step includes responding to includes responding to further comprising: determining an event notification indicative of addition of a new component to the [[SAN,]] topology and an attribute of the first representation indicative of absence of [[that]] the new component; and

[[by]] determining whether the new component is in the second representation in response to determining that the new component is absent from the first representation; and;
[[, if so,]] updating the second representation to indicate that component's status is suspect in response to determining that the new component is in the second representation.

14. (Currently Amended) [[In the]] The method of claim 10, the further improvement wherein the responding step includes responding to determining the discrepancy that results in

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performing the recovery operation on the second representations comprises determining an event notification indicative of addition of a new component to the [[SAN,]] topology and an attribute of the first representation indicative of the presence of [[that]] the new component, by performing a recovery operation on the second representation.

15. (Currently Amended) [[In the]] The method of claim 10, the further improvement wherein the responding step includes responding to determining the discrepancy that results in selectively disregarding the event notification comprises determining an event notification indicative of addition of a relationship between components of the [[SAN,]] topology and an attribute of the first representation indicative of absence of that relationship, by disregarding the event notification.

16. (Currently Amended) [[In the]] The method of claim 10, the further improvement wherein the responding step includes responding to determining the discrepancy that results in performing the recovery operation on the second representations comprises determining an event notification indicative of addition of a relationship between components of the [[SAN,]] topology and an attribute of the second representation indicative of the presence of that relationship, by performing a recovery operation on the second representation.

17. (Currently Amended) [[In the]] The method of claim 10, the further improvement wherein the responding step includes responding to determining the discrepancy that results in selectively disregarding the event notification comprises determining an event notification indicative of addition of a relationship between components of the [[SAN,]] topology and an attribute of the second representation indicative of the absence from the [[SAN]] topology of one of [[he]] the components to that relationship, by disregarding the event notification.

18. (Currently Amended) [[In the]] The method of claim 10, the further improvement wherein the responding step includes responding to determining the discrepancy that results in performing the recovery operation on the second representations comprises determining an event notification indicative of modification of an attribute of a component of the [[SAN,]] topology

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and an attribute of the second representation indicative of the absence from the [[SAN]] topology of that component, ~~by performing a recovery operation on the second representation.~~

19. (Currently Amended) [[In the]] The method of claim 10, the further improvement wherein ~~the responding step includes responding to determining the discrepancy that results in performing the recovery operation on the second representations~~ comprises determining an event notification indicative of modification of an attribute of a component of the [[SAN,]] topology and an attribute of the second representation indicating presence of representation of that component in the second representation but its absence from the [[SAN,]] topology by ~~performing a recovery operation on the second representation.~~

20. (Currently Amended) [[In the]] The method of claim 10, the further improvement wherein ~~the responding step includes responding to determining the discrepancy that results in selectively disregarding the event notification~~ comprises determining an event notification indicative of a missing component of the [[SAN,]] topology and an attribute of the second representation the absence of that component from the topology [[SAN]], ~~by disregarding the event notification.~~

21. (Currently Amended) [[In the]] The method of claim 10, the further improvement wherein ~~the responding step includes responding to determining the discrepancy that results in selectively disregarding the event notification~~ comprises determining an event notification indicative of a missing component of the [[SAN,]] topology and an attribute of the second representation indicates inclusion of that component in the second representation, but the absence of that component from the [[SAN,]] topology ~~by disregarding the event notification.~~

22. (Currently Amended) [[In the]] The method of claim 10, the further improvement wherein ~~the responding step includes responding to determining the discrepancy that results in selectively disregarding the event notification~~ comprises determining an event notification indicative of a missing relationship between components of the topology [[SAN,]] and an attribute of the second representation indicative of absence of that relationship in the second representation, ~~by disregarding the event notification.~~

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23. (Currently Amended) [[In the]] The method of claim 10, ~~the further improvement~~
~~wherein the responding step includes responding to determining the discrepancy that results in~~
~~selectively disregarding the event notification comprises determining~~ an event notification
indicative of a missing relationship in the [[SAN,]] topology and an attribute of the second
representation indicates inclusion of that relationship in the second representation, but the
absence of that component from the [[SAN,]] topology ~~by disregarding the event notification~~.